United States Department of Agriculture
Natural Resources Conservation Service

USDA-NRCS Agency Briefing

December 9thth, 2010

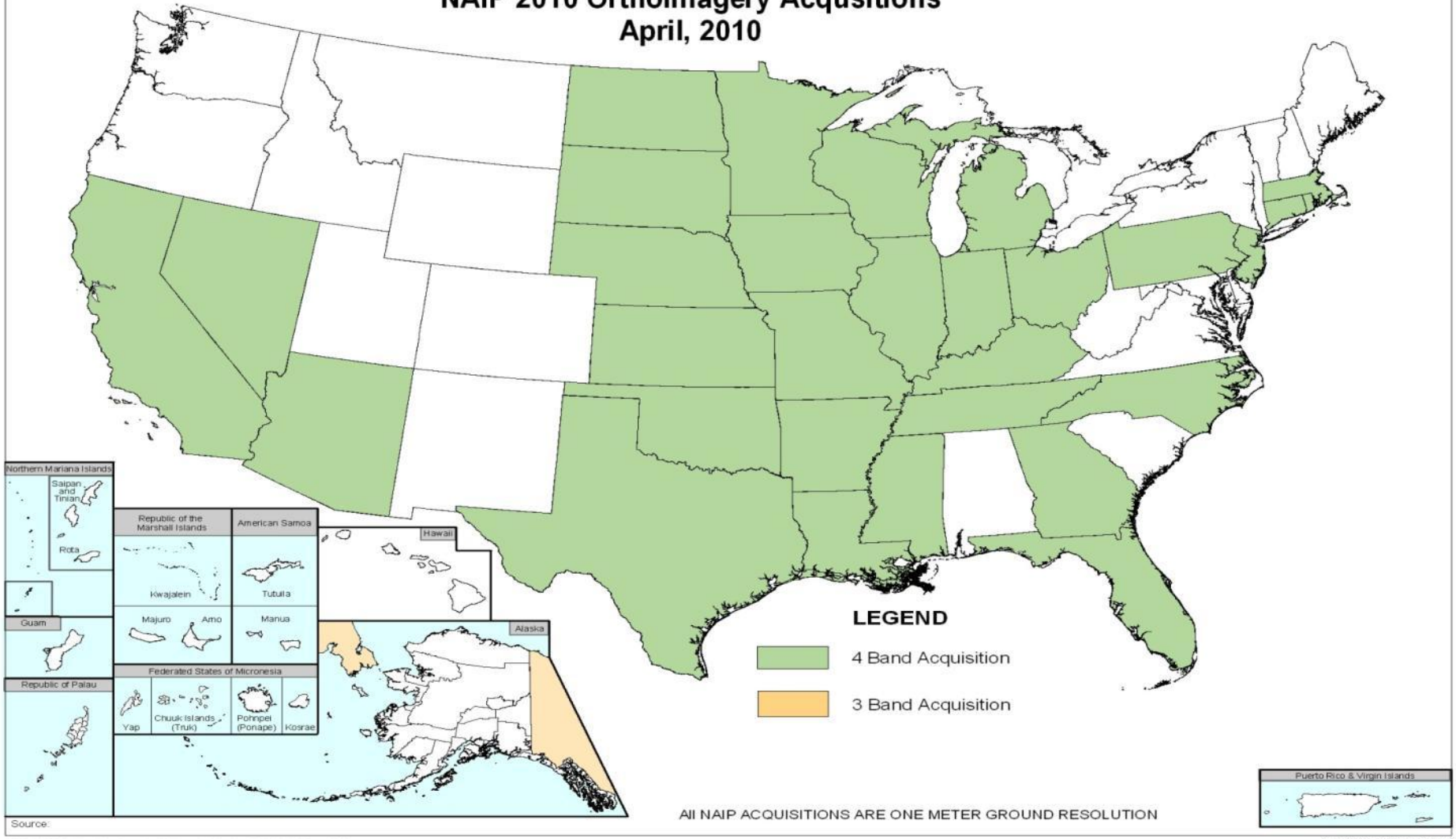
Salt Lake City, Utah

Anthony Kimmet
USDA-NRCS-National Geospatial Management Center

US DEPARTMENT OF AGRICULTURE

NATURAL RESOURCES CONSERVATION SERVICE

NAIP 2010 Orthoimagery Acqusitions
April, 2010



Source:

USDA NRCS National Cartography & Geospatial Center, Fort Worth, Texas 2006.

All NAIP ACQUISITIONS ARE ONE METER GROUND RESOLUTION

November 2009 1000403

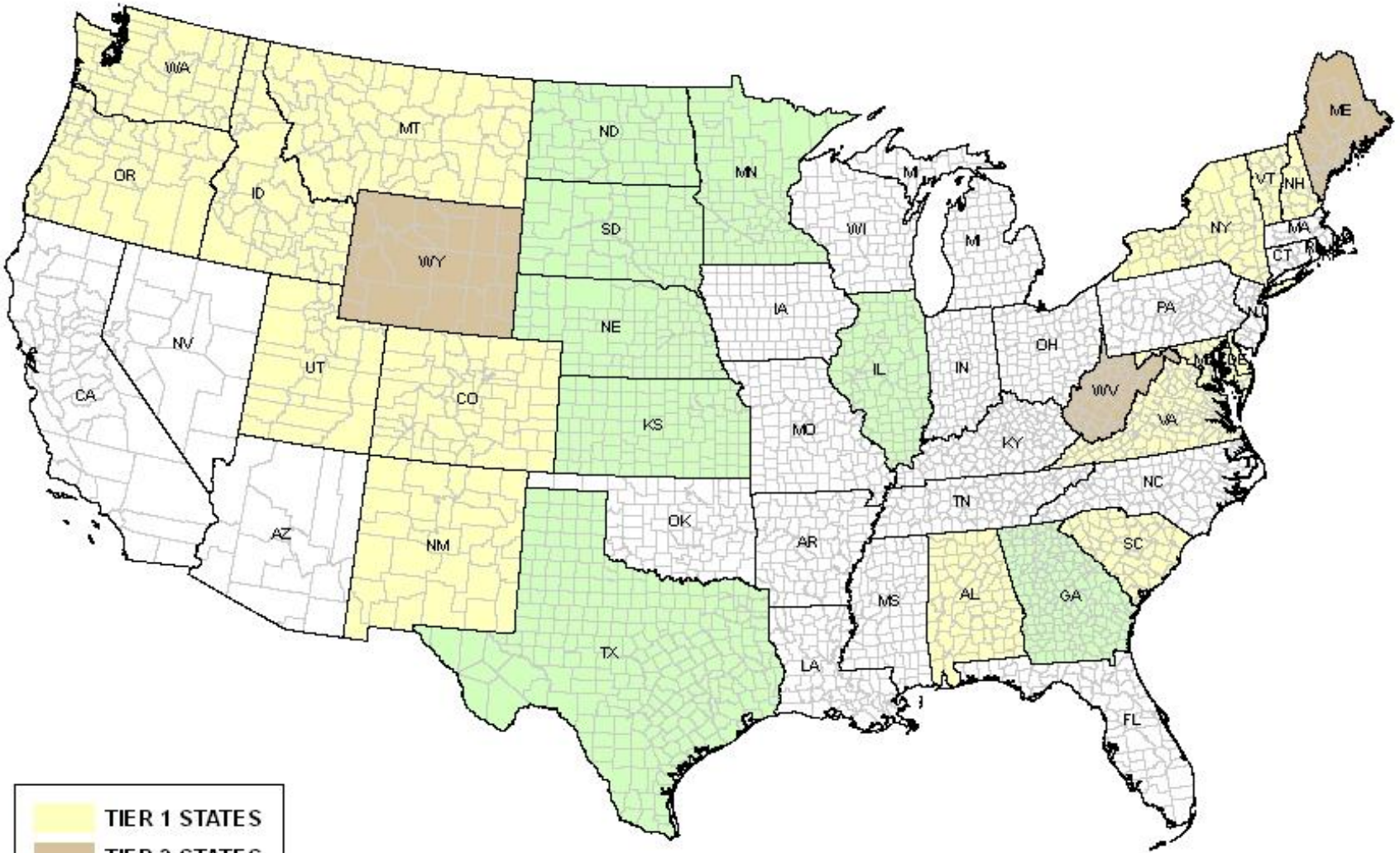
NRCS NAIP Funding

2003 = 2,500,000
2004 = 3,000,000
2005 = 2,600,000
2006 = 2,800,000
2007 = 500,000*
2008 = 500,000*
2009 = 1,750,000*
2010 = 1,900,000*
2011 = 1,900,000 ?

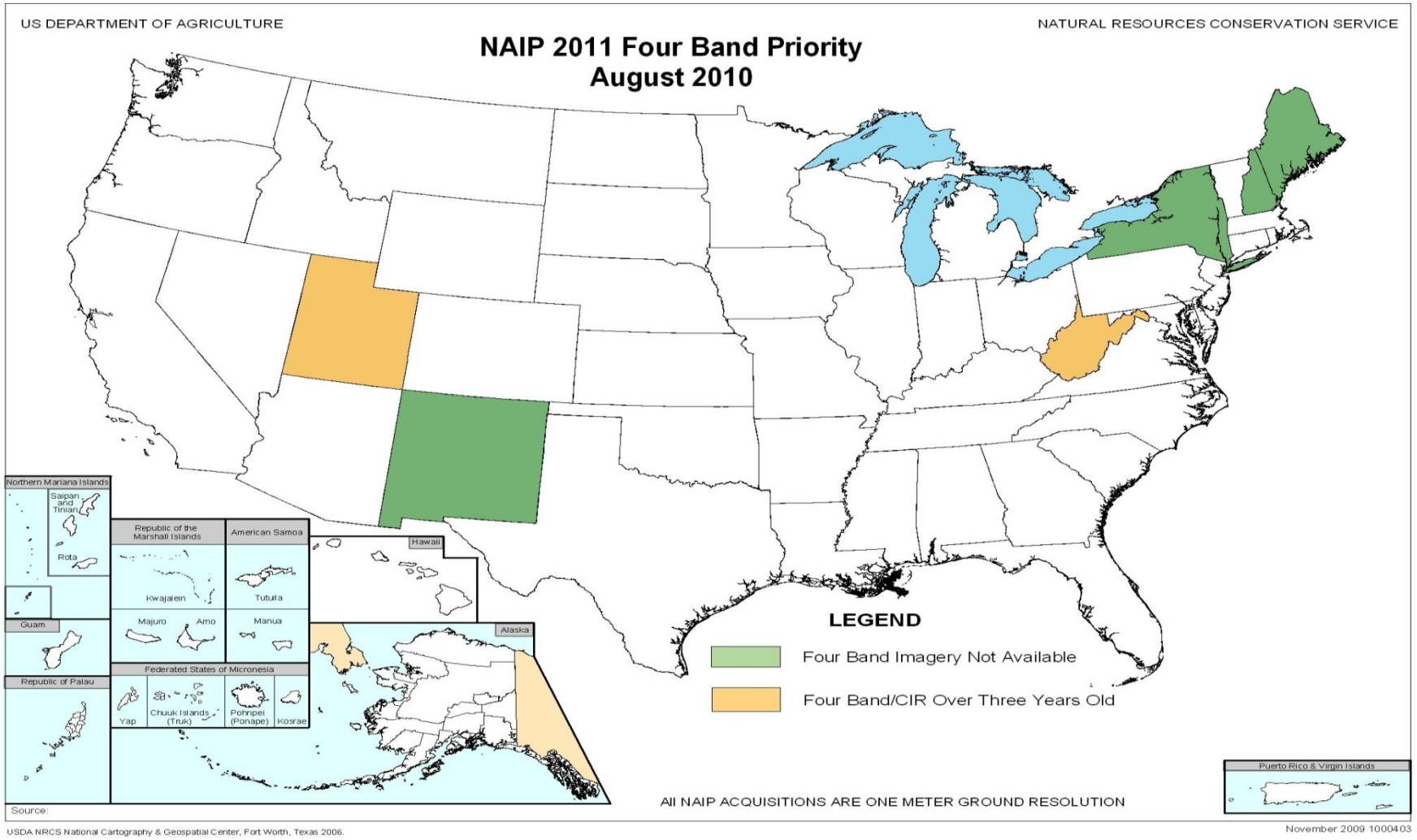
* Plus addition funding via NRCS State Partnerships for NAIP Buy-Ups (4 Band)

Funding for the 2011 NAIP acquisitions will continue to be funded by RIAD.

NAIP 2011 PLANNED STATES



USDA-FSA-APFO



•Upgrading the states above would complete conterminous US with NAIP Four Band Orthoimagery with a acquisition dates of (2009-2011).

•All states in green and orange are Tier 1 (UT, NM, NY, NH) or Tier 2 (WV, ME) states.

NAIP 2011 Four Band Upgrade Costs

New Mexico		184,644
Utah		138,736
New York		89,240
Vermont		16,676*
New Hampshire		17,733
West Virginia*		42,113
Maine*		63,204
	Total	**552,346**

- Tier 1 States (UT, NM, NY, VT and NH) upgrade cost is $ 447,029 .
- Tier 2 States (WV, ME) upgrade cost is $ 105,317.

•Upgrading the states above would complete conterminous US with NAIP Four Band Orthoimagery with a acquisition dates of (2009-2011).

• Maine and West Virginia are Tier 2 which may not be funded in NAIP 2011.

• The upgrade costs listed above are estimates and do not include potential other Federal/State Partnerships funding.

NRCS NAIP 2011 Funding Costs

NRCS Base Partnership Costs	1,450,700
Four Band Upgrade Costs (Tier 1 & 2)	552,346*
Total	**2,003,046**

Success Factors for NAIP

and fully funded IFTN

- Consistently questioned by OMB and Congress: Who is using the imagery and what specifically (i.e., programs) is it being used for? What are the benefits of that use?
- We need to better and more specifically capture *the"how" the "what" and the "who"* at all levels.
- Augment and improve information collection processes currently used for this purpose.

Slide from Kent Williams/Shirley Hall at NDOP Meeting in November, 2010

NAIP Survey Questions to NRCS GIS Specialist

•What business programs/applications use NAIP Imagery in NRCS State/SCA offices? Please also put approximate percent of agency program/application that uses NAIP Orthoimagery. (i.e. Conservation Plans use NAIP Orthoimagery 100%)

•Is it important to acquire 4 Band NAIP Orthoimagery with CIR?

•What are the uses for Natural Color / CIR NAIP data?

•Do you share NAIP data with other government agencies, local organizations etc… Who are these entities?.

•Is there any other type of Orthoimagery data (High Resolution, Leaf-Off, Satellite etc...) used in NRCS State/SCA offices besides NAIP? Why?

•How often do we need to refresh NAIP Orthoimagery or the number of years between acquisitions? For Example if you select 3, you would like new NAIP Orthoimagery every 3 Years.

•If the NAIP refresh included CIR (4 Band) imagery, would you be willing to receive NAIP data less frequently? (i.e. every 4 years instead of every 3 years with a Natural Color acquisition)

NRCS NAIP Surveys

The previous Survey was submitted to 13 NRCS GIS Specialists for comment. (OR, AZ (2), WY, NE, KS, TX, MS, WI, OH, FL, MI, VA, VT)

As of today, December 9th, we have received comments back from 12 GIS Specialist.

NRCS-NGMC (Dan Good, Tony Kimmet) would like to expand the survey to additional NRCS user groups (Soils, Field Office Staff , Centers etc..)

NRCS will investigate the capability of capturing metrics on usage of Orthoimagery in Conservation Delivery Streamlining Initiative (Conservation Plans, Planned Practices, Protracts), Soils etc..

- NRCS has 1.6 Million Conservations
- 30 Million Planned Practices

NRCS-NGMC will coordinate a methodology with APFO for delivery of survey results.

NAIP Survey Questions to ask NRCS GIS Specialist

What business programs/applications use NAIP Imagery in NRCS State/SCA offices? Please also put approximate percent of agency program/application that uses NAIP Orthoimagery. (i.e. Conservation Plans use NAIP Orthoimagery 100%)

Sample Response from NRCS GIS Specialist (Value Chain Model?)

"The reality is that almost every product we develop at the state and field level is based on a geographic location and the best way to describe a location on a map or develop geospatial data on a photo identifiable feature is with the NAIP imagery.

Conservation Plans 100%

Wetland Determinations 100%

Financial assistance program application ranking 100%

Engineering Designs at the state and field office 100%"

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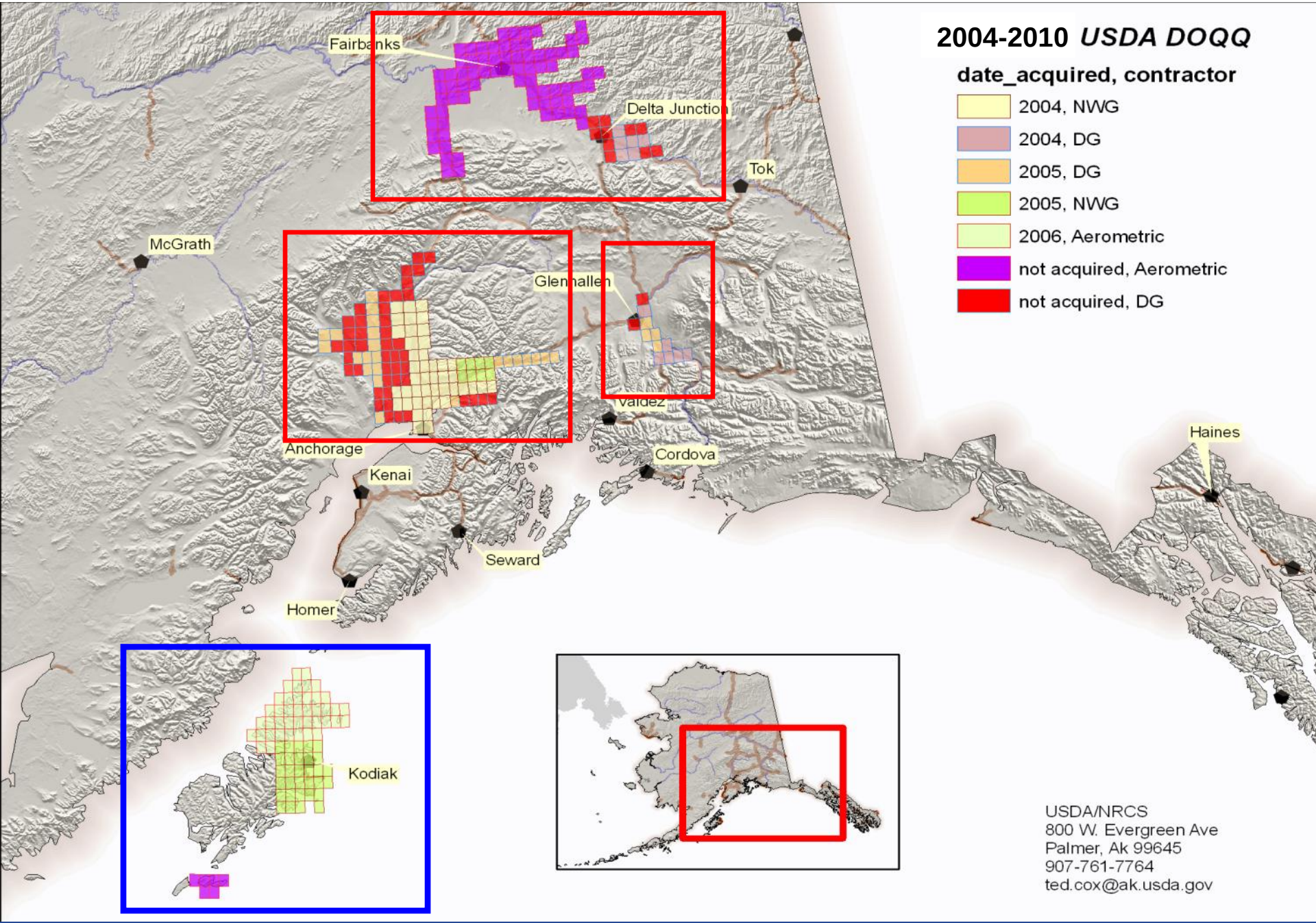
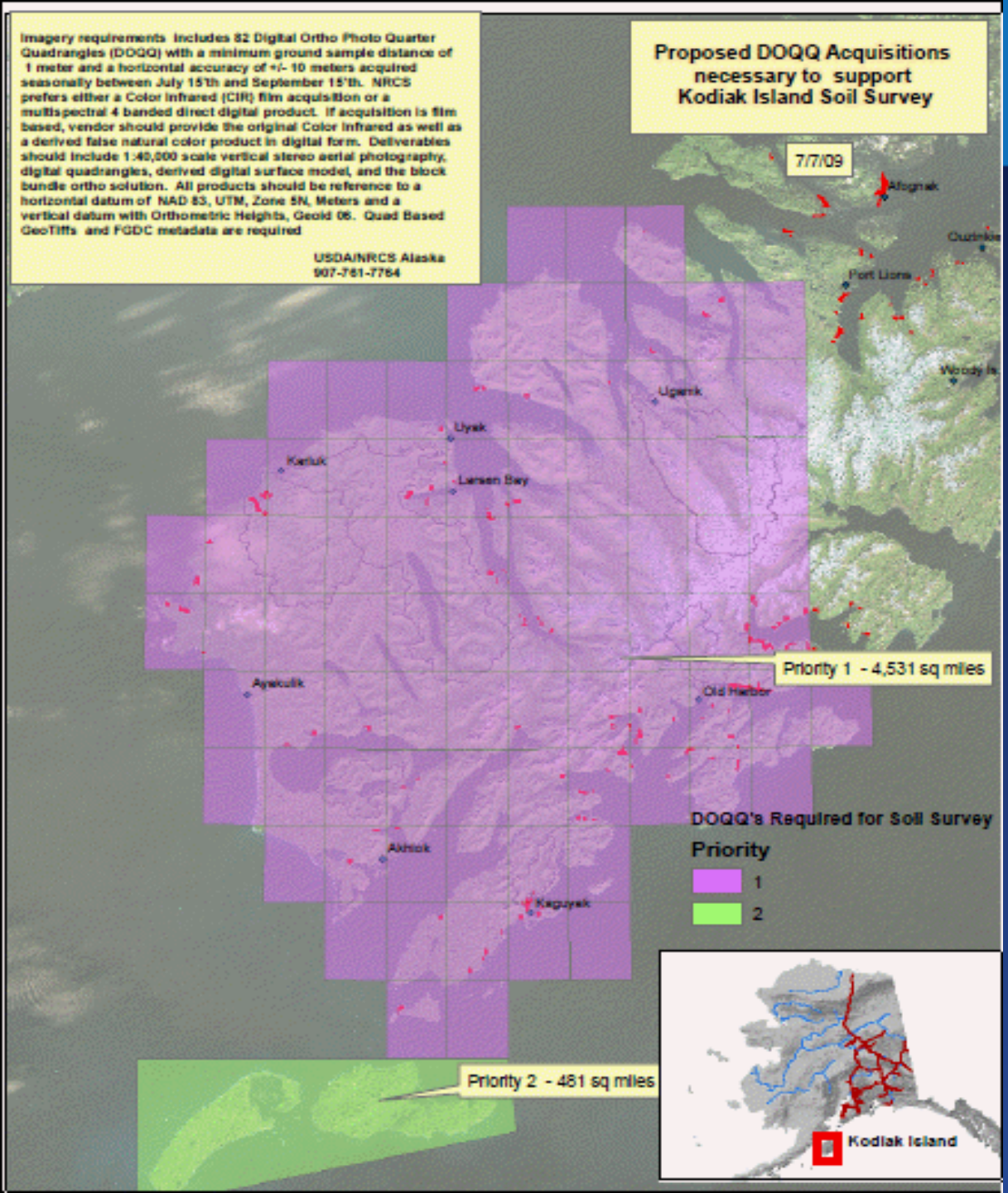
Alaska Update

USDA-NRCS Digital Orthoimagery Acquisition in Alaska



USDA/NRCS
800 W. Evergreen Ave
Palmer, Ak 99645
907-761-7764
ted.cox@ak.usda.gov



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Alaska Orthoimagery Acquisition Kodiak Island

Acquisition Specifications

- Leaf-On
- CIR, Film
- 1:40,000
- One Meter
- Stereo Pairs

- Funded for $ 217,000
- Cost $ 192,000
- Priority 1 and 2 areas contracted by APFO.
- Remainder used in new project in Yukon Flats DG-WorldView-2 test area..
- Partial photography completed in 2009-2010. However contractor has not finished this AOI as of November, 2010.
- NGA/USGS has requested this dataset from NRCS (Dec. 2010).

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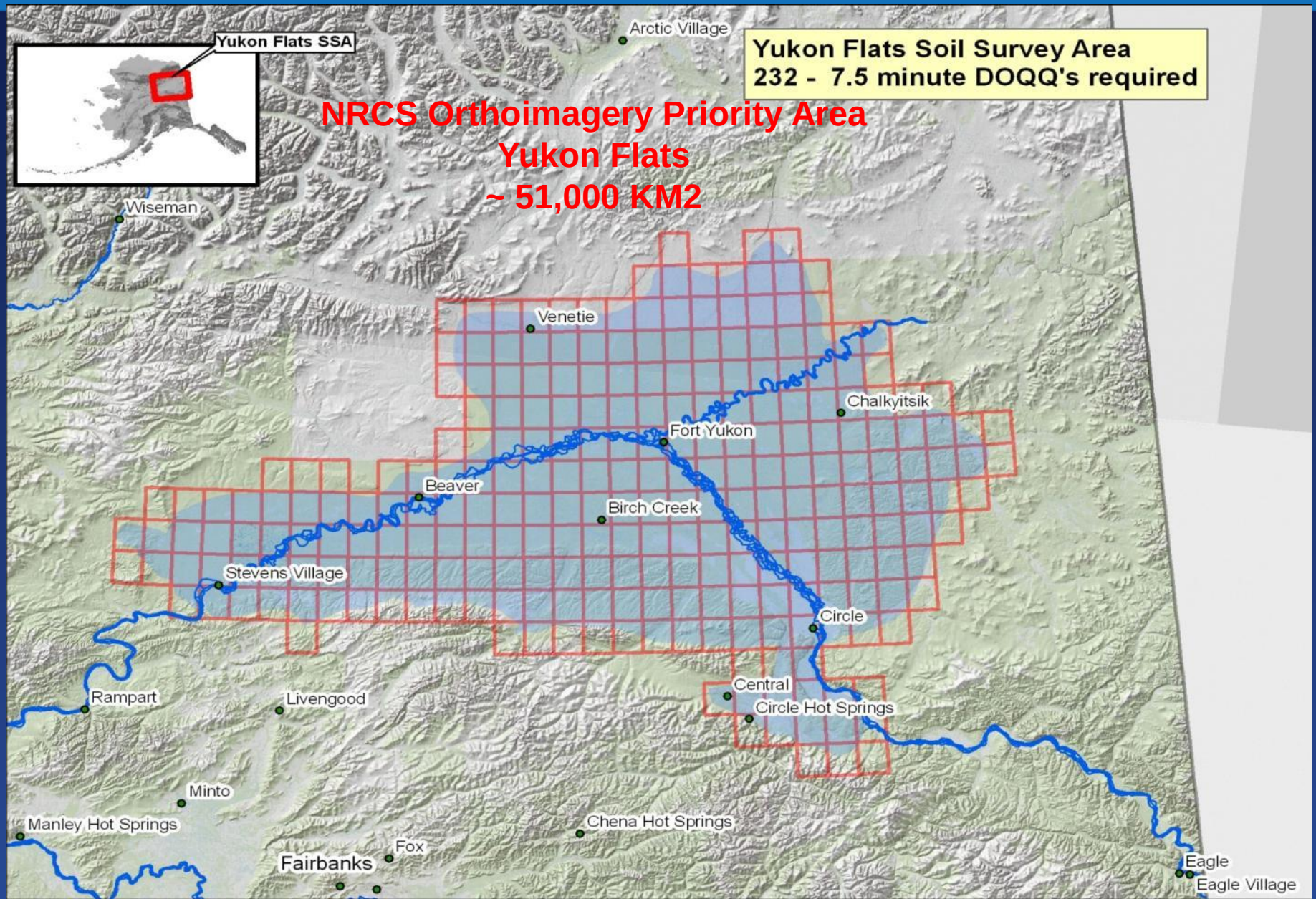

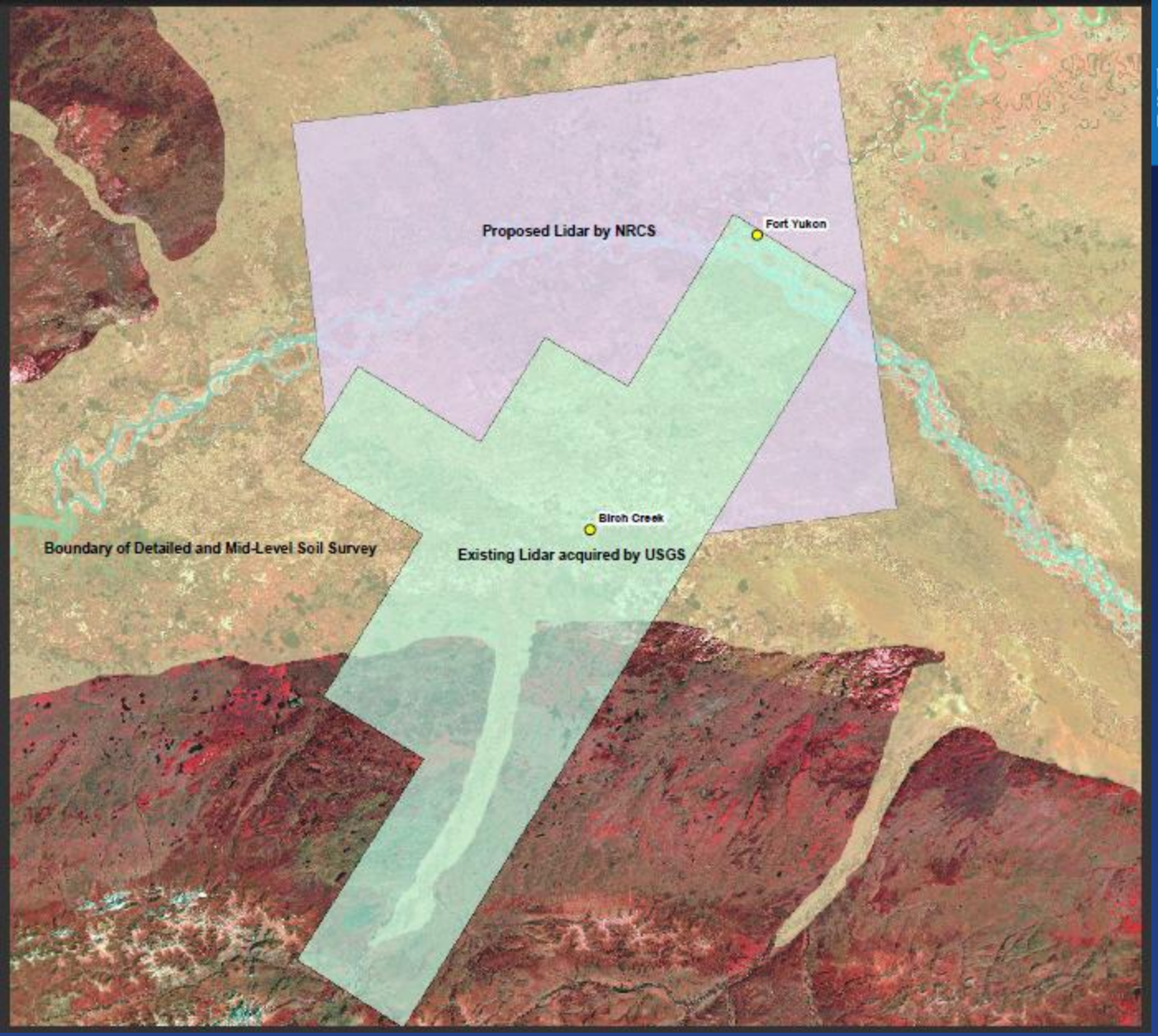

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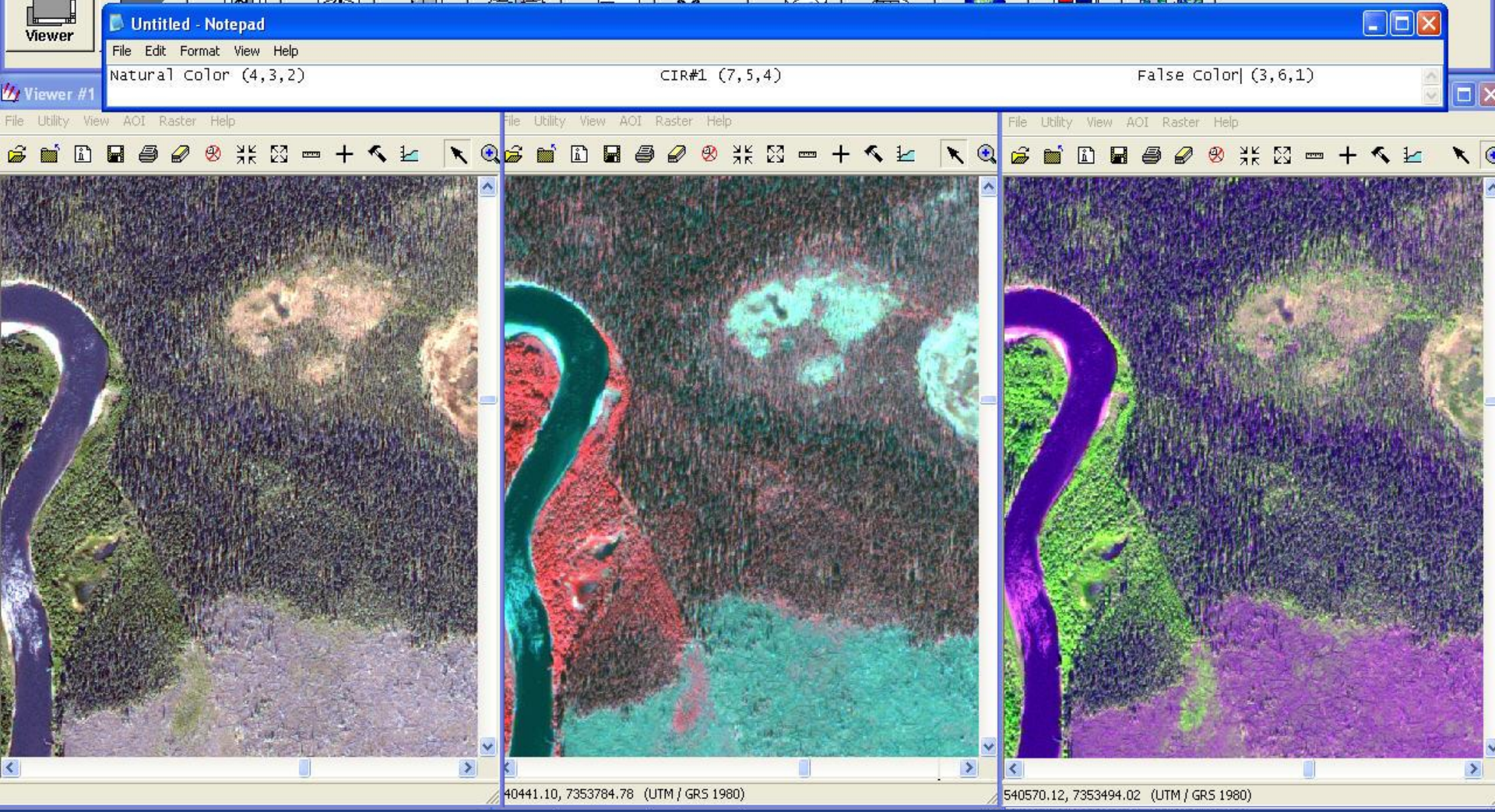
Yukon Flats, Alaska

USGS Acquired LiDAR for an small area in Yukon Flats

This area is of interest by USDA-NRCS (Soil Mapping), USGS (Climate Change Studies, and BLM/SOA (Gas Pipeline)


Yukon Flats, Alaska
LiDAR based DEM Hillshade
Northern edge of Loess hills (permafrost soil slumping?)



- Prototype IG/WV-2 8 Band Imagery (1,100 KM2) for Yukon Flats was ordered from FSA-APFO.
- NRCS-Alaska (Ted Cox) supports this acquisition with full 8 Band Multi-Spectral/Pan data bundle.
- The above WV2 scene was ordered by APFO on August 17th, 2010!
- NGMC received on August 24th!
- AOI partially overlaps new LiDAR collected by USGS for project area.

Yukon Flats, Alaska Orthoimagery

- NRCS has contributed $380,000 towards this project towards the end of FY2010. Funding is at USGS-MCMC.

- Acquisition method has not been determined. Concern about lack of aerial sensors. Can other Satellite sensors such as Spot 5 meet our Imagery needs for Soil Survey Mapping?

- Testing will finish sometime in early 2011 of the DG-WV, 8 Band test area.

- Estimated cost vary from $ 450,000 for Aerial acquisition to $ 800,000 for a complete DG-WV-2 8 Band acquisition.

- NRCS-NGMC has received two additional areas in Alaska for Orthoimagery acquisition.

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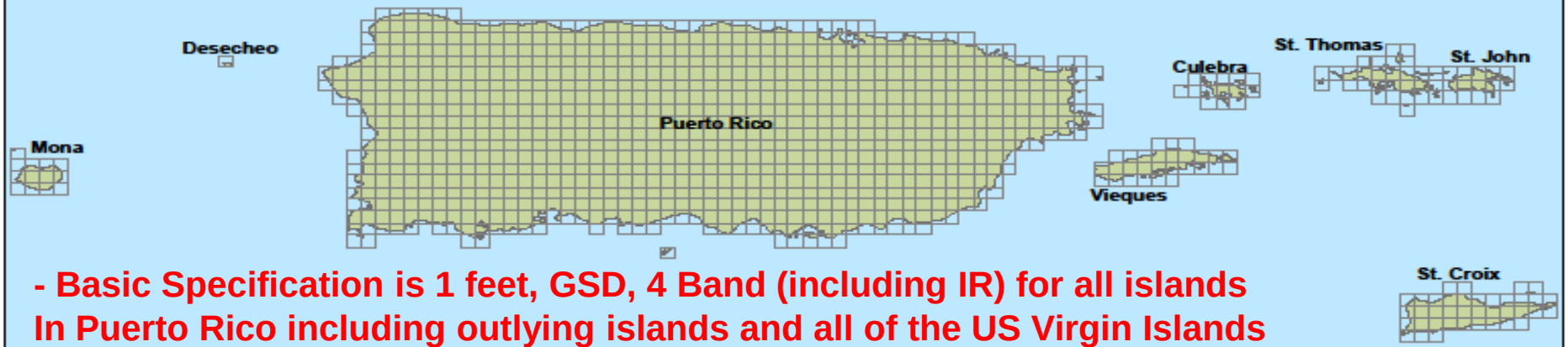
USDA-NRCS Alaska Imagery/Elevation Funding

Fiscal Year	
2004	1,397,592
2005	153,000
2006	1,875,000
2007	300,000
2008	0
2009	317,000
2010	380,000
Total FY 2004-10	4,422,592

2010 Puerto Rico and Virgin Islands Acquisition Plan



- Basic Specification is 1 feet, GSD, 4 Band (including IR) for all islands In Puerto Rico including outlying islands and all of the US Virgin Islands

- Awarded and administrated by USACOE-Jacksonville, FL.

- Acquisition of 28% of island as of 11/30/2010.

Puerto Rico and U.S. Virgin Islands Orthoimage Index

Index tiles are nominal 1/16th USGS Quad Sheets

0 12.5 25 50

Miles

2010 Puerto Rico and Virgin Islands Acquisition Plan

- US Army Corp of Engineers, Jacksonville, Florida will issue a modified RFP very soon for Puerto Rico and Virgin Islands.

- Best acquisition periods is late fall (Oct-Dec) and early spring (March-April).

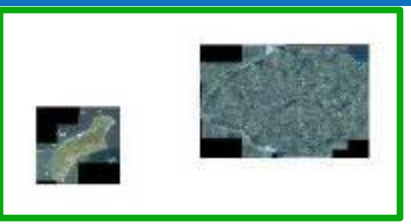
- Committed funding (from James Suggs, USACOE)

300 K	NGA
350 K	USGS (Agency and ARRA)
150 K	USACOE
20 K	USFS
100 K	USDA-NRCS
47 K	EPA
20 K	USFS
120 K	VRIM, PRHTA, PR-DNR and ER

$ 1,087,000 Total

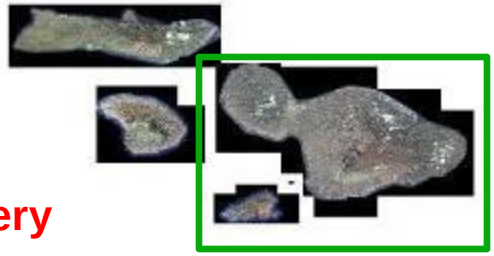
Puerto Rico LiDAR DEM's (USACOE?)


Hawaii/Pacific Basin



Hawaiian Islands
December 2010

Available in first half of 2011



- **Hawaii Orthoimagery was completed for the first time in December 2009.**

- **All islands except Oahu have 4 Band Orthoimagery at .6 Meter GSD**

- **USGS, State of Hawaii and USDA have contracted for complete coverage of all 8 major Hawaiian Islands with DigitalGlobe/WorldView-2 Satellite Orthoimagery.**

- **ALL of Hawaii will be collected with DigitalGlobe – WorldView-2, 8 Band Multi-Spectral Imagery!**

- **Hawaii will be the first state with complete coverage of High Resolution Multi-Spectral data from WV-2!**

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Hawaii Orthoimagery Data Distribution 2010

- After USDA upgraded the DigitalGlobe Orthoimagery License to Enterprise Premium we shipped the following to many Federal/Sate Agencies
  - Complete Orthoimagery coverage in GeoTIFF/MrSID format for all of the Hawaii
  - Updated Metadata including license provisions and limitations
  - HR Orthoimagery coverage for Oahu (2005 and 2008)
  - Processed IfSAR DEM from InterMap including License information

- The above dataset was sent to…
  - USDA-FS (3 Locations)
  - USDA-NRCS
  - USDA-FSA-APFO
  - USDA-APHIS
  - USGS (3 Locations)
  - NOAA (3 Locations)
  - NPS
  - DOD – Florida
  - NGA
  - State of Hawaii
  - Census Bureau

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- **USDA-NRCS with the help of the USFS upgraded all USDA acquired DigitalGlobe QB2 Orthoimagery for Hawaii and the Pacific Basin to Enterprise Premium.**

- **USGS and State of Hawaii have agreed that the Enterprise Premium License will meet their agency application requirements.**

- **Allows USDA to post compressed Orthoimagery mosaics of all Hawaii/Pacific Basin QuickBird data to the Public on the USDA Gateway. All users (Federal Civil/Defense, State, Local, Educational, General Public, US Territories/Trusts) except for profit companies have access to these datasets.**

USDA-NRCS-NGMC held two Orthoimagery briefings…

1) August, 13th at the USGS Office in Oahu, Hawaii
2) August 16th, at the Pacific Disaster Center in Maui, Hawaii

Attendance is estimated at around 35 individuals total for both briefings.

1) USGS
2) USDA-NRCS
3) State of Hawaii
4) National Park Service
5) NOAA
6) Pacific Disaster Center (NGA)
7) Honolulu County
8) Maui County (Planning Office)
9) University of Hawaii
10) ESRI – Hawaii
11) GeoTech for Hawaii Schools (K-12)
12) East and West Maui Watershed Partnership (FWS Funded)
13) The Nature Conservancy
14) Maui Electric and Tax Assessors Offices
15) Business/Utilities – Akimeka, Geospatial Consulting Group International (Dewberry)

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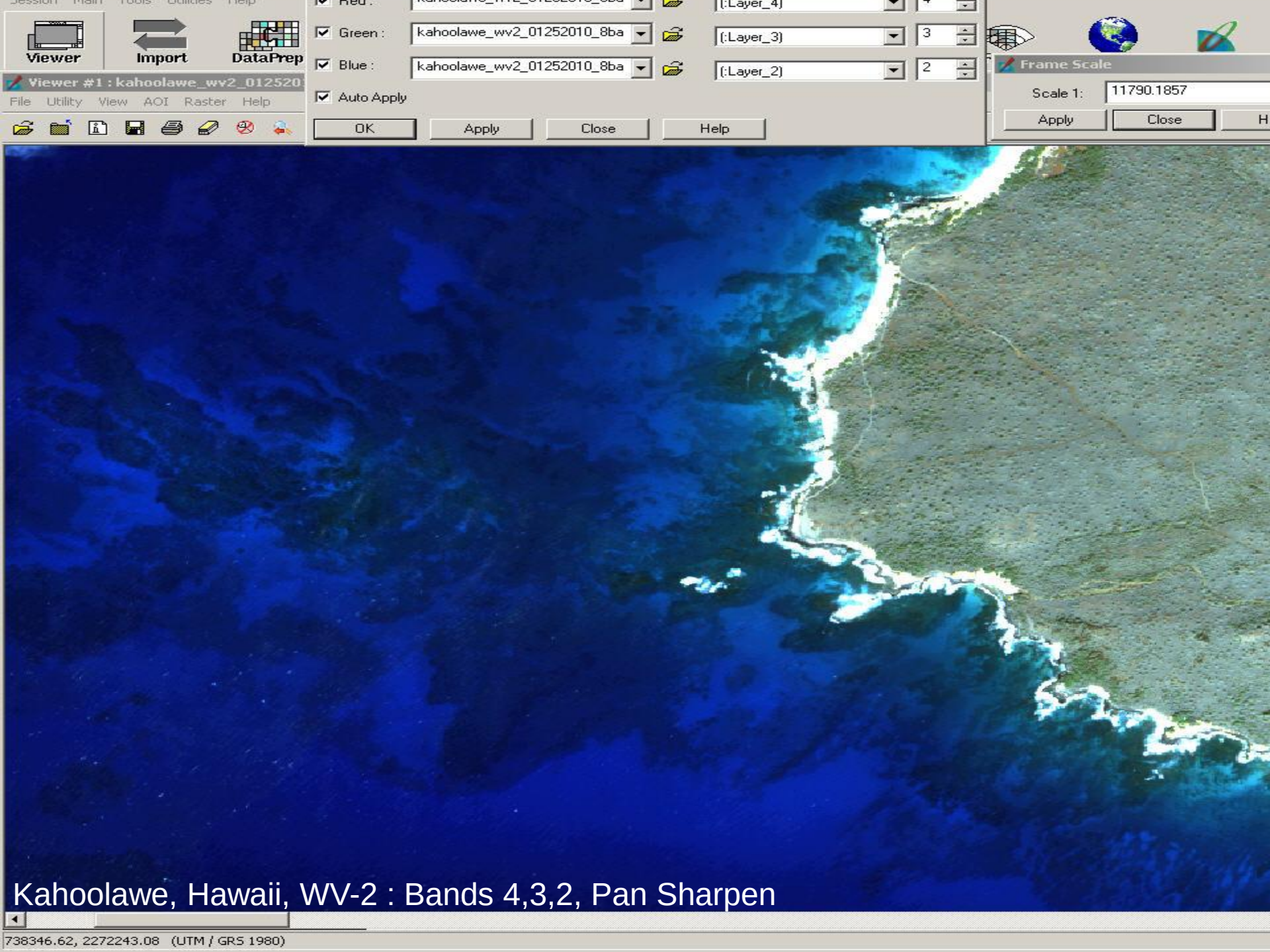
Hawaii and Pacific Basin Orthoimagery 2009-2010 Contributions

USGS	$ 168,000*
State of Hawaii	$ 140,000*
USFS	$ 130,000*
USDA –NRCS	$ 160,000**

Total	**$ 598,000**

Sometimes during a presentation, I like to tell a story about how NRCS is effecting our environment in a positive way and possible how Geospatial data can help. Kahoolawe, Hawaii is in the background. I took this picture on my last trip to Hawaii.


Kahoolawe has endangered plants and wildlife


Viewer
Import
DataPrep
Viewer #1 : kahoolawe_wv2_012520
File Utility View AOI Raster Help
Red :
Green :
kahoolawe_wv2_01252010_8ba
Blue :
kahoolawe_wv2_01252010_8ba
Auto Apply
OK
Apply
Close
Help
(:Layer_4)
(:Layer_3)
3
(:Layer_2)
2
Frame Scale
Scale 1:
11790.1857
Apply
Close
Kahoolawe, Hawaii, WV-2 : Bands 4,3,2, Pan Sharpen
738346.62, 2272243.08 (UTM / GRS 1980)

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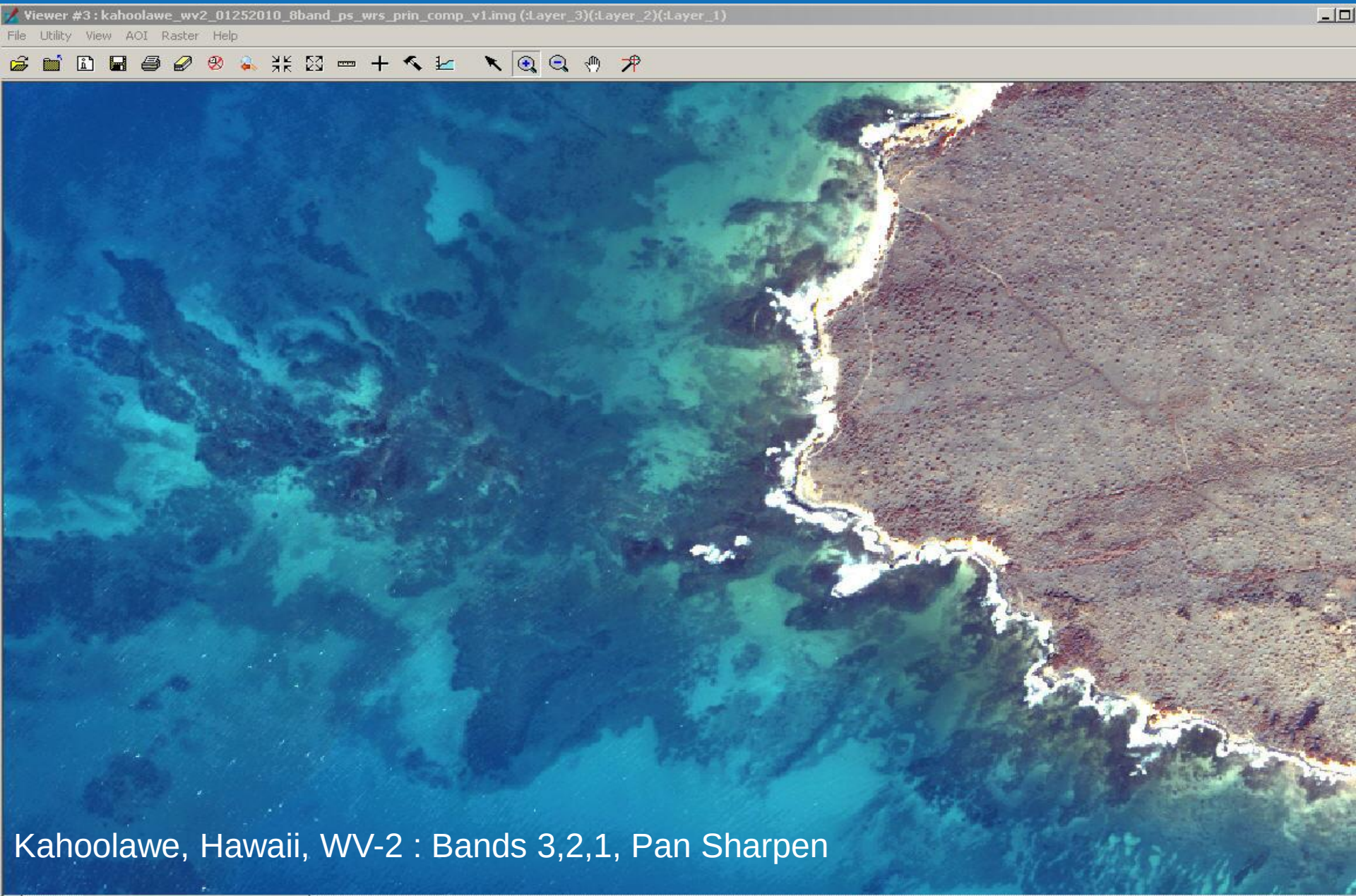
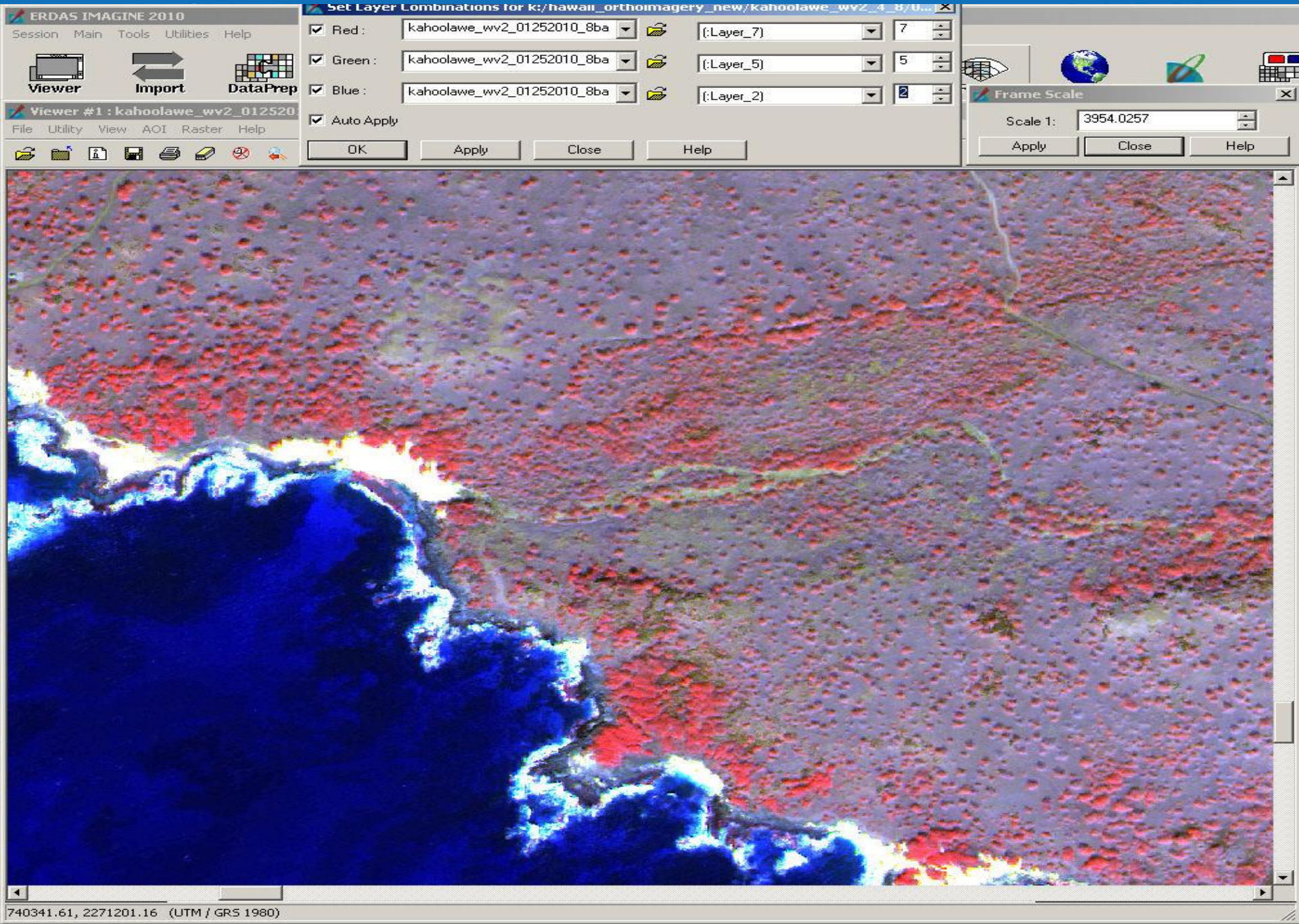
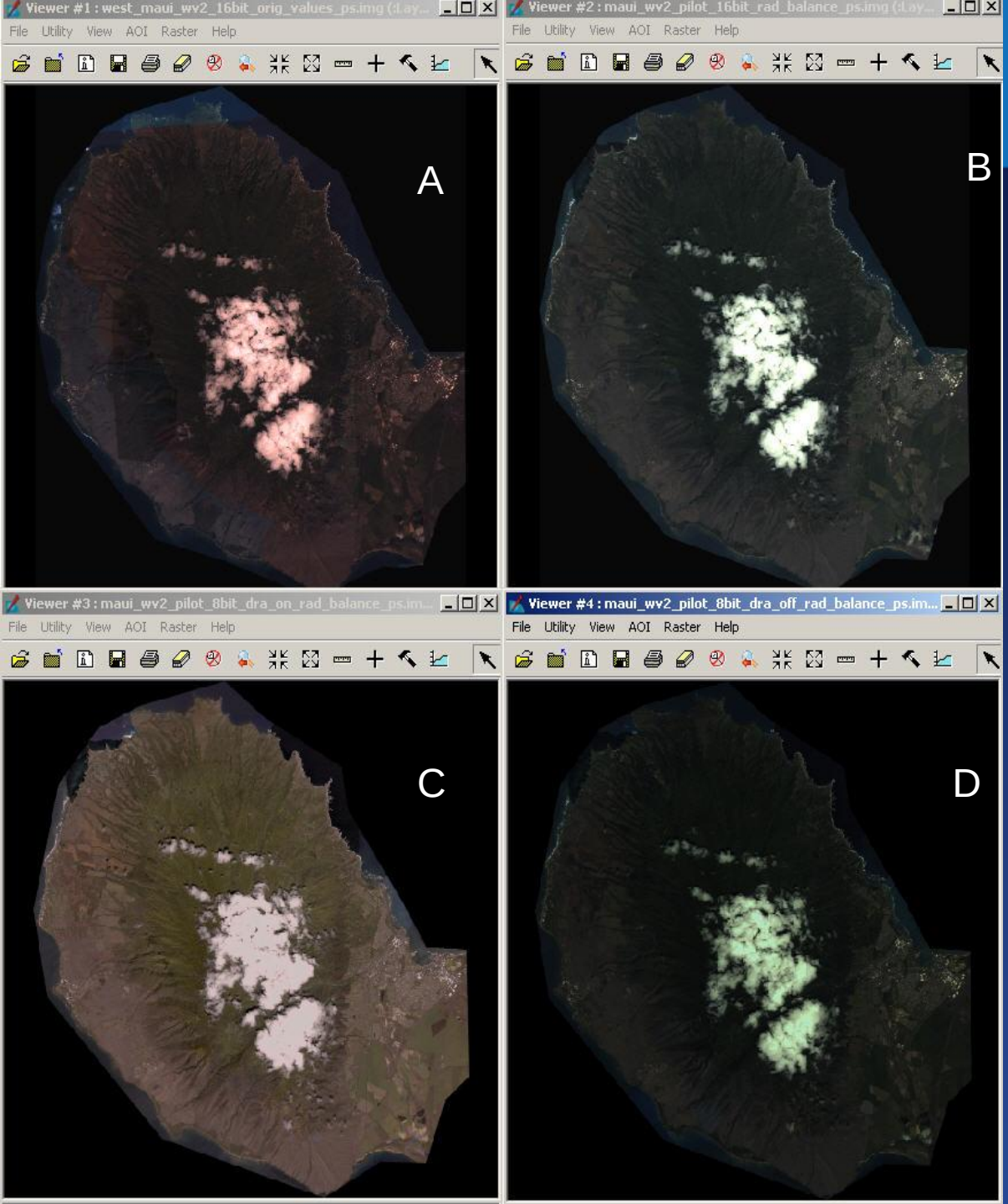


Kahoolawe, Hawaii, WV-2 : Bands 3,2,1, Pan Sharpen

Kahoolawe, Hawaii, WV-2 : Bands 7,5,2, Pan Sharpen





A: Original Values, 16 Bit
B: Radiometric Balance, 16 Bit
C: 8 Bit, DRA On
D: 8 Bit, DRA Off

- Total of four different test files for West Maui. Variety of products were sent to the following test sites.

- USGS-EDC
- County of Maui
- USGS/NOAA-Hawaii
- FSA-APFO
- NRCS-NGMC

Conclusion:
ALL test sites agreed that the Radiometric balanced data was best for planimetric and likely analysis situations. Most agreed that the 16 bit data would be best delivered format.

USDA-NRCS DG-WorldView-2 Requests for Orthoimagery

NRCS has received requests for DG/WorldView-2, 8 Band Orthoimagery for several states in the CONUS. All requested areas are tasking.

- WA (3 Sites)
- CA (1 Site)
- AZ (3 Sites)
- NM (1 Site)
- NV (3 Sites)
- UT (2 Sites)
- AK (3 Sites)

NRCS State Offices believe that 8 Band Multi-Spectral Orthoimagery can assist in mapping areas that are very remote for field mapping.

USDA-NRCS DG-WorldView-2 Acquisition Scenarios

	USDA/Partners	NGA
8 Bands MS	X	
4 Bands MS (2,3,4,7)		X
16 Bit Data	X	
8 Bit Data		X
Enterprise Premium Lic.	X	
NextView/Civil Gov't		X
Cost to USDA	X	

FOUO : USDA

NGA (NextView) is one of the very best federal government groups to work with for Geospatial Imagery data!

Pacific Basin Orthoimagery

•USDA-NRCS has funded or will likely finish the following with DG-WorldView-2 acquisition:

- Guam
- CNMI (Partial = Saipan, Rota, Tinian, Pagan)
- American Samoa (5 Islands)
- Midway Atoll
- Palmyra Atoll

NRCS Digital Elevation Acquisitions

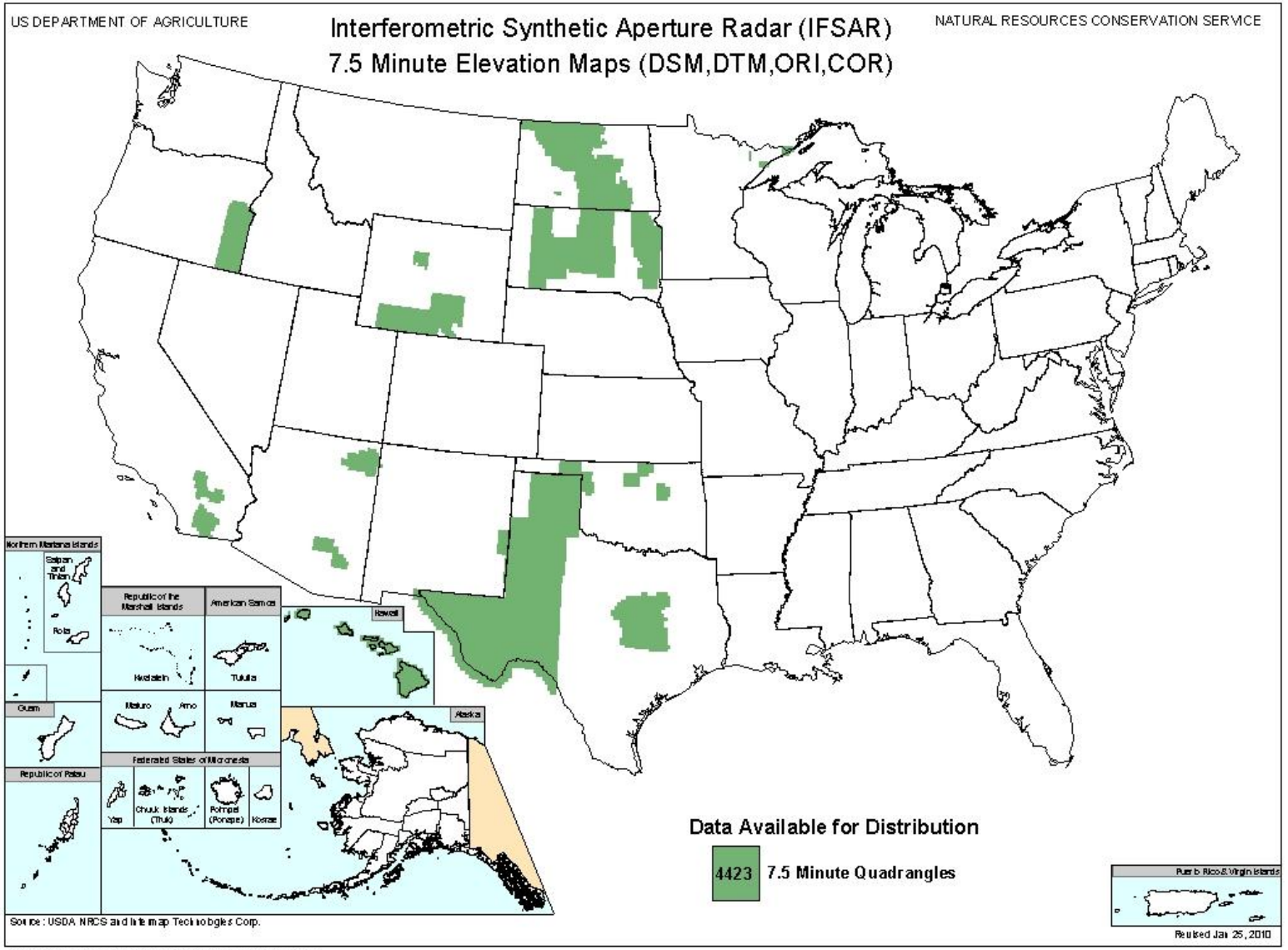
- FY 2004-2010 NRCS funded Digital Elevation acquisition for $ 11,000,000.

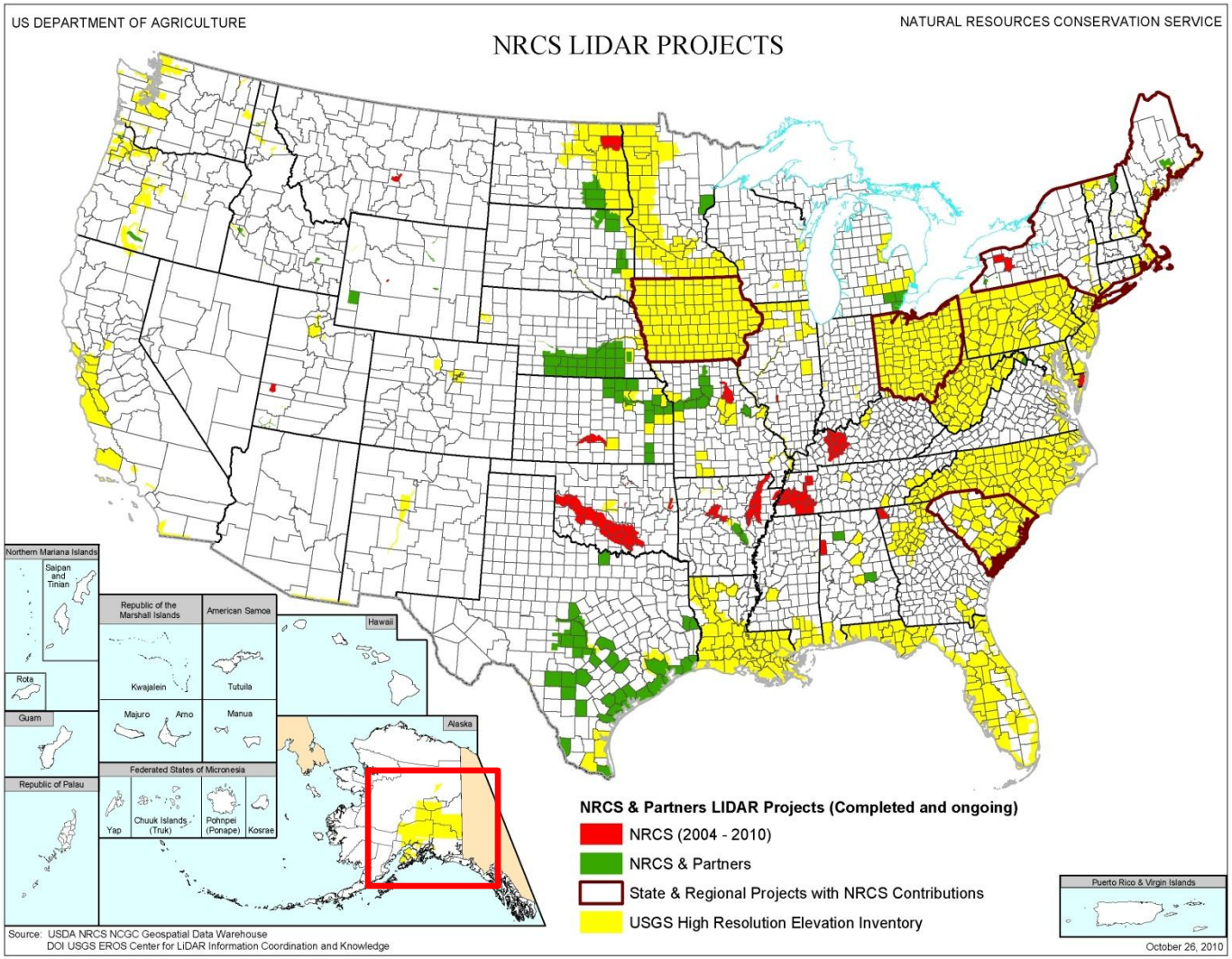
- FY 2010 NRCS (NHQ/State Offices) funded Digital Elevation for $ 5,000,000 via USGS-MCMC and USACOE.

- Some NRCS State Offices have suggested that Higher Resolution Digital Elevation (LiDAR/IfSAR) may be a higher priority than Orthoimagery.

- NRCS program applications such as following benefit from LiDAR/IfSAR
  - Conservation Plans and Designs (Terrace, Waterways , Diversions)
  - WRP/Wetland Restoration
  - Dam Hazard Analysis
  - Flood Modeling
  - Enhance Precision Agriculture Capabilities

- Steven Nechero is the DEM contact for NRCS .


US DEPARTMENT OF AGRICULTURE
Interferometric Synthetic Aperture Radar (IFSAR)
7.5 Minute Elevation Maps (DSM,DTM,ORI,COR)
NATURAL RESOURCES CONSERVATION SERVICE
Northern Mariana Islands
Saipan and Tinian
Rota
Guam
Republic of Palau
Republic of the Marshall Islands
American Samoa
Kwajalein
Tutuila
Maturo
Arno
Manua
Federated States of Micronesia
Yap
Chuuk Islands (Truk)
Pohnpei (Ponape)
Kosrae
Hawaii
Alaska
Data Available for Distribution
4423
7.5 Minute Quadrangles
Puerto Rico & Virgin Islands
Source : USDA NRCS and Intermap Technologies Corp.
Revised Jan 25, 2010
USDA NRCS National Cartography & Geospatial Center, Fort Worth, Texas 2009



NRCS has funded all areas shaded in green and red.

NRCS has assisted in funding some areas shaded by yellow or highlighted in with red line

NRCS has an additional funding at USGS-MCMC and USCAOE for funding LiDAR projects in 2011.

USDA-NRCS FY 2010 Orthoimagery Acquisition Highlights

- Contributed to 2010 NAIP which collected 30 States of NAIP. All NAIP 2010 was 4 Band.

- Organized a new contract to acquire Hawaii via DigitalGlobe Worldview-2.

- Funding for some/all of the Yukon Flats AOI in Alaska.

- Assisted in funding for Puerto Rico/US Virgin Islands with High Resolution (1 Ft. GSD), 4 Band Orthoimagery via USACOE.

- Collected Imagery of over 73,000 NRI/WRP sites with a combination of Analog/Digital Sensors.

FY 2010 Total Orthoimagery and Digital Elevation Acquisitions

9,089,322	NRI/WRP/Digital Camera Pilot
1,900,000*	NAIP
420,000*	Alaska
60,000*	Hawaii and Pacific Basin
~5,000,000	Digital Elevation**
16,469,322	**Total***

* In addition, NRCS State Offices made contributions

** Digital Elevation funded by NRCS (NHQ, States) via USGS-MCMC and USACOE

Suggested Funding for Orthoimagery Acquisition in FY 2011

NAIP w/ Partial Four Band Orthoimagery Upgrades $ 1,900,000

Potential Orthoimagery Projects for NRCS?

- NAIP ½ Meter, Four Band Prototype
- Special Project Orthoimagery (HR, Multi-Spectral, Hyper-Spectral etc..)
- Alaska (Imagery and DEM's needed!)
- Hawaii/Pacific Basin (Satellite Based)
- Illinois High Resolution Orthoimagery Project
- Leaf-Off Orthoimagery (DG AOAP?)

Analysis from NRCS …

•NRCS needs to assist FSA in determining metrics for use of NAIP in business applications.

•NRCS Orthoimagery requirements may very depending region and funding available

•NRCS potentially will need other types of imagery (High Resolution-Leaf-Off, Multi-Spectral, Hyper Spectral) for specific agency applications such as CDSI, Soil Survey, NRI, Watershed Analysis, Dam Monitoring, Wildlife Habitat Analysis, Invasive Species etc...

•NRCS will invest more into Digital Elevation datasets via partnerships (USGS, NGA , State etc… NRCS is reviewing a Draft Copy of a consultant report from Dr. David Maune.

•NRCS has a requirement for Imagery in geographical areas outside the continental US (Alaska, Hawaii, Pacific Basin, Puerto Rico and the US Virgin Islands).

And Finally…

Thank You ….FSA-APFO, Shirley Hall and Glenn Bethel for your contributions to Geospatial data for USDA.

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